SECTION 8

EDOS - DAAC INTERFACE DESIGN

Section 8 - EDOS - DAAC Interface Design

8.1 Data Description and Formats

The following paragraphs define the content and format for each interface message and data product exchanged between the EDOS and the DAACs, including data items, data representation, and data structures.

8.1.1 Data Format Overview

DAAC to EDOS Data Set (DEDS):

A. DEDS Packing List
B. DEDS Media Description File
C. Level 0 or Level 1A Data Sets

DEDS Packing List:

A. Packing List Preamble
B. MediaID
C. Granule UR
D. ESDT
E. Files
    1. Distribution File Name
    2. Size
    3. Estimated Size
    4. Compression Status

DEDS Media Description File:

A. Unique File Name
B. Requested File Name
C. File Size
D. Data Source
E. Compression Type

Level 1A Data:

TBD

Expedited Data Set (EDS) and Production Data Set (PDS) Construction Records:

A. Software version number
B. Data Set Identification
C. Data Set Test Flag

D. List of scheduled SCS start times for the Data Set
E. List of scheduled SCS stop times for the Data Set
F. Count of packets containing EDOS generated fill data
G. Count of packets with discrepancies between packet header length field and actual packet length
H. CCSDS binary time code in the secondary header of first packet in the data set
I. CCSDS binary time code in the secondary header of last packet in the data set
J. ESH date and time annotation of first packet in the Data Set
K. ESH date and time annotation of last packet in the Data Set
L. Count of packets from VCDUs with errors corrected by R-S decoding
M. Count of packets in the Data Set
N. Data Set size (in octets)
O. Count of packets with SSC discontinuities
P. Time of Data Set completion
Q. Identify APID(s) associated with the Data Set
R. By APID, identify an index to the first packet, containing the APID, in the Data Set
S. By APID, identify the VCDU-IDs (SCID and VCID) associated with the APID
T. By APID, count of packets with SSC discontinuities
U. By APID, list missing packet SSCs for the Data Set (not applicable for packet secondary header expedited flagged data)
    a. Identify first missing packet SSC in the gap
    b. Identify index into data set to missing packet, with the same APID, that is immediately after the SSC gap in the Data Set
    c. Count of packet SSCs missing within a gap
    d. CCSDS binary time code from the secondary header of the packet, with the same APID, that is immediately before the SSC gap in the Data Set
    e. CCSDS binary time code from the secondary header of the packet, with the same APID, that is immediately after the SSC gap in the Data Set
    f. ESH date and time annotation of the packet, with the same APID, that is immediately before the SSC gap in the data set
    g. ESH date and time annotation of the packet, with the same APID, that is immediately after the SSC gap in the data set
V. By APID, list packets containing EDOS generated fill data including location of first fill octet for each packet
W. By APID, index into the Data Set to the fill packet
X. By APID, count of octets of EDOS generated fill data
Y. By APID, count of packets with discrepancies between packet header length field and actual packet length
    a. For this APID, list SSCs of packets with length discrepancy.
Z. By APID, CCSDS binary time code in the secondary header of first packet in the Data Set

AA. By APID, CCSDS binary time code in the secondary header of last packet in the Data Set
AB. By APID, ESH date and time annotation of first packet in the Data Set
AC. By APID, ESH date and time annotation of last packet in the Data Set
AD. By APID, count of packets from VCDUs with errors corrected by R-S decoding
AE. By APID, count of packets in the Data Set
AF. By APID, size (in octets)
AG. For the data set, Number of Files storing Path SDUs
- **a. For each File, file name**
- **b. For each File, APIDs present**
- **c. For each File and APID, CCSDS timecode from first and last packet**

Expedited Data Set (EDS):

A. EDS Construction Record
B. Path Service Data Units

EDOS Archive Removable Physical Media Unit:

A. PDS Physical Media Unit Delivery Record File
B. PDS (for PDS number "1", two or more files are present (each being less than or equal to the maximum size specified in the EDOS-DAAC OA). The first File only contains the PDS Construction Record, and each file thereafter contains the Path SDUs.)
C. . . . Additional PDSs (if applicable)
D. PDS (for PDS number "n", two or more Files are present (each being less than or equal to the maximum size specified in the EDOS-DAAC OA). The first File only contains the PDS Construction Record, and each file thereafter contains the Path SDUs.)
E. EOF (End-of-file)

EDOS Ground Message Header:

A. Message Type/Test Message Type
B. Source Identification
C. Destination Identification
D. Message Generation Date and Time
E. Mission's Spacecraft Identification
F. Message Sequence Number
G. EDOS Software Version Number
H. Message Length

File Name Convention for a PDS and an EDS:

A. File Type (EDS or PDS)
B. APID(s) in the data set
C. Time of PDS/EDS creation
D. Numeric Identification (one-up counter)
E. File Name Extension (".PDS" or ".EDS")

File Name Convention for a PDS and an EDS Delivery Record:

A. File Type (EDS or PDS Delivery Record)
B. APID(s) in the data set
C. Time of PDS/EDS creation
D. Numeric Identification (one-up counter)
E. File Name Extension (".PDR" or ".EDR")

File Name Convention for a PDS/EDS Acceptance Notification:

A. File Type (EDS or PDS Acceptance Notification)
B. Time of file creation
C. File Name Extension (".PAN" or ".EAN")

File Name Convention for a PDS Physical Media Unit Delivery Record:

A. File Type (PDS Physical Media Unit Delivery Record)
B. Bar Code Label/Serial Tape Number
C. File Name Extension (".MDR")

File Name Convention for the Signal file (See Section 3.5)

A. Name of file to be sent via FTP
B. Signal File Name Extension (.XFR)

Production Data Set (PDS):

A. PDS Construction Record
B. Path Service Data Units

PDS/EDS Acceptance Notification:

A. EDOS Ground Message Header
B. Message Type
C. Message Length
D. PDS/EDS Delivery Record Sequence Number
E. For each file transmitted:
    a. File Directory
    b. File Name
    c. File Transfer Disposition

PDS and EDS Delivery Records:

A. EDOS Ground Message Header
B. Exchange Data Unit Label
C. PDS/EDS Delivery Record Label
D. Originating System
E. Consumer System
F. Product Name
G. Mission
H. Data Set Identification
I. Name of Sensor or Instrument
J. Directory Name
K. File names and sizes
L. Data Set transfer start date and time
M. Data Set transfer end date and time

PDS/EDS Identification:

A. Data Structure Identification Character
B. First APID in the Data Set
C. Second APID in the Data Set
D. Third APID in the Data Set
E. Time of EDS/PDS creation
F. Numeric Identification

PDS Physical Media Unit Delivery Record:

A. Exchange Data Unit Label
B. PDS/EDS Delivery Record Label
C. Record Type (Message Type)
D. Destination Identification
E. EDOS software Version Number
F. Physical Media Unit ID (Bar Code Label/Serial Tape Number)
G. Date and time of physical media unit completion
H. For each PDS on the physical media unit:
    a. PDS Identification
    b. CCSDS binary timecode of first packet in the PDS
    c. CCSDS binary timecode of last packet in the PDS
    d. Count of packets in the PDS
    e. Size (in octets)
    f. Test flag indicator
    g. List of APIDs
    h. File name(s) and their size for each file storing a part of a PDS

EDOS Archive Physical Media Unit Delivery Letter:

A. Message Type
B. Originating System
C. Destination System

D. Request Sequence Number
E. Number of requested data sets on the physical medium
F. Requested Data Sets Identification
G. Data Set Identification
H. Data Set Level

8.1.2 General Data Format and Description

8.1.2.1 EDOS Ground Message Header

This EDOS Ground Message Header (Table 8.1.2.1-1) precedes each of the following messages sent by, and/or received at, EDOS (PDS and EDS Delivery Records and PDS/EDS Acceptance Notification).

Table 8.1.2.1-1. EDOS Ground Message Header*

Item No.	Name	Format & Size	Data Characteristics
1	Message Type/Test Message Type	Unsigned Integer 1 Byte	Range for Message Type -> 0 through 127, and Range for Test Message type > 128 through 255 (Test Message Type equals Message Type plus 128). Refer to Table 8.1.2.2-1 for EDOS External Message Type Definitions. This field uniquely identifies the message, and indicates to the receiver what message format to expect and process.
2	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
3	Source Identification	Unsigned Integer 1 Byte	Range -> 0 through 255, Reference Table 8.1.2.3-1.
4	Destination Identification	Unsigned Integer 1 Byte	Range -> 0 through 255, Reference Table 8.1.2.3-1.
5	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
6	Message Generation Date and Time	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT).

Table 8.1.2.1-1. EDOS Ground Message Header* (Continued)

Item No.	Name	Format & Size	Data Characteristics
7	Mission's Spacecraft Identification	Unsigned Integer 2 Bytes	Value -> 0=Not applicable for this message; otherwise => 42 = AM-1; Reference ICD Table 5.1.3-2. Spacecraft identification for the Mission associated with this message.
8	Message Sequence Number	Unsigned Integer 2 Bytes	Range -> 0 through 65,535; one-up counter that wraps around, on reaching the largest value, to smallest value; This number is one-up per Source Identification, and is assigned by the originator.
9	EDOS Software Version Number	Unsigned Integer 2 Bytes	Range -> 0 through 255 (first byte - identifies a major EDOS release) and 0 through 255 (second byte - represents a version of the major release - initial version or an update version)
10	Message Length	Unsigned Integer 2 Bytes	Range -> 24 through 65,535 Number of bytes in the message. This value includes the EDOS Ground Message Header plus the attached message's length. A length of 24 means the EDOS Ground Message Header is self contained. A length of zero (0) indicates that the message is longer than 65,535 bytes (however, messages exchanged via UDP must not be larger than 65,535 bytes)
11	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
Total of 24 bytes exist in the EDOS Ground Message Header.			

*Not used by ECS

8.1.2.2 EDOS External Message Type Definitions

Table 8.1.2.2-1 - EDOS External Message Type Definitions identifies the message type within the EDOS Ground Message Header (in Binary format).

Table 8.1.2.2-1. EDOS External Message Type Definitions

EDOS External Message Name	Message Type
Reserved	0-8
PDS Delivery Record	9
Reserved	10
EDS Delivery Record	11
PDS and EDS Acceptance Notification	12
Reserved	13-127
Test Message Type - equals Message Type plus 128	128-255

8.1.2.3 EDOS Source/Destination Identification

Table 8.1.2.3-1 - EDOS Source/Destination Identification identifies EDOS and all its external interfaces in order to identify the source and destination within the data structures for this interface.

Table 8.1.2.3-1. EDOS Source/Destination Identification

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
Reserved for future use	0	Not Applicable (N/A)
EDOS	1	EDO
Reserved for future use	2-4	N/A
EOS Test System (ETS)	5	ETS
Goddard Space Flight Center (GSFC)	6	GSF
ASTER Instrument Control Center (ICC)	7	ICC
Langley Research Center (LaRC)	8	LRC
Reserved for future use	9	N/A
ASTER Science Data Processing Segment (SDPS)	10	SDP
Reserved for future use	11	N/A

Table 8.1.2.3-1. EDOS Source/Destination Identification (Continued)

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
White Sands Ground Terminal Upgrade (WSGTU)	12	WSG
Second TDRSS Ground Terminal (STGT) (at White Sands)	13	STG
Reserved	14	N/A
Reserved	15	N/A
Wallops Orbital Tracking Station (WOTS) (at Wallops Island Station)	16	WOT
EOS Polar Ground Station (EPGS) at Poker Flat, Alaska	17	AGS
EOS Polar Ground Station (EPGS) at Spitzbergen, Norway	18	SGS
Reserved for future use	19- 255	N/A

8.1.2.4 NASA PB-5 Code Format

Table 8.1.2.4-1 - NASA PB-5 Code Format (Option C) identifies the Greenwich Mean Time (GMT) time of an event, in PB-5 format (Reference ICD Section 2 of this ICD, Applicable Document 9), that is used in the data structures for this interface.

Table 8.1.2.4-1. NASA PB-5 Code Format (Option C)

Item No.	Name	Format & Size	Data Characteristics
PB-5 is the format in which the Greenwich Mean Time (GMT) is stored.			
1	Flag Bit	Integer 1 Bit	Value = 1, Reference PB-5 Time Code “option C”.
2	Truncated Julian Day	Unsigned Integer 14 Bits	Range -> Variable; Truncate the most significant decimal digits, retaining only the four least significant decimal digits ranging from 0000 to 9999; The current Julian day epoch begins on October 10, 1995 and continues for a period of 27.379 years.
3	Seconds of Day	Unsigned Integer 17 Bits	Range -> Variable, Seconds-of-day from 0 to 86,399.

Table 8.1.2.4-1. NASA PB-5 Code Format (Option C) (Continued)

Item No.	Name	Format & Size	Data Characteristics
4	Milliseconds of a Second	Unsigned Integer 10 Bits	Range -> 0 through 999
5	Microseconds of a Millisecond	Unsigned Integer 10 Bits	Range -> 0 through 999
6	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bits	Value -> zero (0).
NASA PB-5 code format (Option C) has 6 items placed within 7 bytes. Reference Section 1 - Applicable Document 9, for additional information.			

8.1.2.5 Spacecraft Identification (SCID)

Table 8.1.2.5-1 - Spacecraft Identification (SCID) identifies the forward and return link spacecraft identification within the data structure for this interface.

Table 8.1.2.5-1. Spacecraft Identification (SCID)

Spacecraft	Identifier *
Refer to Applicable Document 8, Paragraph 6.1.3.1.2.1	
EOS AM-1	42 = x'2A'
* The Return Link identifier is used as the Spacecraft ID.	

8.1.2.6 Greenwich Mean Time (GMT) in ASCII Format

Table 8.1.2.6-1 - Greenwich Mean Time (GMT) in ASCII Format identifies the GMT in ASCII format used within the data structure for this interface.

Table 8.1.2.6-1. Greenwich Mean Time (GMT) in ASCII Format

Item No.	Name	Format & Size	Data Characteristics
1	Year	ASCII 2 Bytes	Value -> "00" through "99"; contains the value of the two least significant digits of the Year (from the GMT/ZULU).
2	Julian Day	ASCII 3 Bytes	Value -> "001" through "366"; contains the Julian day (from the GMT/ZULU).
3	Hour	ASCII 2 Bytes	Value -> "00" through "23"; contains the hour (from the GMT/ZULU).
4	Minute	ASCII 2 Bytes	Value -> "00" through "59"; contains the minute (from the GMT/ZULU).
5	Second	ASCII 2 Bytes	Value -> "00" through "59"; contains the second (from the GMT/ZULU).
This GMT/ZULU ASCII format contains 11 bytes. Example: 95366235959			

8.1.2.7 PDS and EDS Construction Record

A PDS and an EDS Construction Record (Table 8.1.2.7-1) records quality and accounting information, respectively, for a PDS and an EDS.

Table 8.1.2.7-1. PDS/EDS Construction Record

Item No.	Name	Format & Size	Data Characteristics
1	EDOS Software Version Number	Unsigned Integer 2 Bytes	Range -> 0 through 255 (first byte - identifies a major EDOS release) and 0 through 255 (second byte - represents a version of the major release - initial version or an update version)
2	Construction Record Type	Unsigned Integer 1 Byte	Value -> 1=PDS, 2=EDS (expedited data sets based on APID), and 3=EDS (expedited data sets based on Secondary Header quick-look flag being set by the sending instrument).
3	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
4	PDS/EDS Identification	ASCII 36 Bytes	PDS/EDS Identification -> Refer to Table 8.1.2.8-1
5	Fill/Spare, reserved for future use.	Unsigned Integer 7 Bits	Value -> zero (0).

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
6	Test Flag	Logical Flag 1 Bit	Value -> 0=Operational Data 1=Test Data
7-1	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
7-2	Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
For the PDS/EDS, identify the SCS start and stop times			
8	For the PDS/EDS, Identify number of scheduled SCS start-stop times	Unsigned Integer 2 Bytes	Range -> 1 through 65,535, one up counter.
8-1	For this PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
8-2	For this PDS/EDS SCS Start & Stop time pair, SCS start time	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT).
8-3	For this PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
8-4	For this PDS/EDS SCS Start & Stop time pair, SCS stop time	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT).
8-5	For the next SCS start and stop time pair, repeat the above items (8-1 through 8-4) (if applicable)		
9	For the PDS/EDS, count of octets of EDOS generated fill data.	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power less 1) Count of octets of EDOS generated fill data (within the entire data set)
10	For the PDS/EDS, count of packets that had discrepancies between packet header length item and actual packet length.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Note: Counter increments whenever the packet length identified in the packet header was different than the actual packet's length during Return Link Service Processing.

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
11	For the PDS/EDS, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of first packet in the PDS/EDS.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2.
12	For the PDS/EDS, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of last packet in the PDS/EDS.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2.
13	For the PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
14	For the PDS/EDS, ESH date and time annotation of first packet in the PDS/EDS	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). This is a copy of the time of receipt from within the ESH that belongs to the first packet in the acquisition session.
15	For the PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
16	For the PDS/EDS, ESH time and date annotation of last packet in the PDS/EDS	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). This is a copy of the time of receipt from within the ESH that belongs to the last packet in the acquisition session.
17	For the PDS/EDS, count of packets from VCDUs with errors corrected by R-S decoding.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Number of VCDUs corrected by Reed Solomon (R-S) (R-S is a grade 2 service for AM-1. This count is incremented whenever the ESH item - R-S Error Control Flag contains a zero and then the ESH item -Source VCDU Error Decode Results contains a value other than zero.)
18	For the PDS/EDS, count of packets in the PDS/EDS	Unsigned Integer 4 Bytes	Range -> 1 through 4,294,967,295

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
19	For the PDS/EDS, size (in octets).	Unsigned Integer 8 Bytes	Range -> 7 through (2 to the 64th power less 1). Total number of octets for all CCSDS packets in the PDS/EDS.
20	For the PDS/EDS, identify number of packets with SSC discontinuities.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295. Increment counter by 1 for each gap in the (SSC) number sequence. Note: A gap may exist at the beginning of a PDS/EDS if one or more missing SSC(s) exist between the last SSC in the PDS/EDS immediately preceding the current PDS/EDS under construction and the first SSC in the current PDS/EDS under construction. EDOS does not consider it a gap when the SSC wraps naturally, from 16,383 to 0.
21	For the PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
22	For this PDS/EDS, time of completion.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). Actual time EDOS completed constructing the complete Data Set (Construction Record and Data Set).
23	For this PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 7 Bytes	Value -> zero (0).
For the PDS/EDS, identify the APIDs and their associated information.			
24	For the PDS/EDS, Identify number of APIDs in the PDS/EDS.	Unsigned Integer 1 Byte	Value -> 1 through 3; one-up counter. [Non-ASTER data contains 1 APID per PDS/EDS]
24-1	For the APID, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
24-2	APID (SCID and APID) in the data set.	Unsigned Integer 3 Bytes	SCID and APID (SCID-8 Bits (Refer to Table 8.1.2.5-1-1), Fill Bits-5 Bits, and followed by APID-11 Bits (Refer to Table 8.1.4.1.1-1)).
24-3	For this APID, index (Byte Offset) to the first packet in the PDS/EDS.	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power less 1) 0 equates to the first byte/octet of the first packet in the entire PDS/EDS (This is an index into the entire Data Set, NOT an index into a file containing only part of the data set). This index points to the first byte of the packet.
24-4	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
For this APID, identify the VCID(s)			

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
24-5	For this APID, identify number of VCIDs in the PDS/EDS	Unsigned Integer 1 Byte	Value -> 1 through 2; one-up counter.
24-5.1	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
24-5.2	VCDU-ID (SCID and VCID)	Unsigned Integer 2 Bytes	Spacecraft ID and VCID (Fill Bits-2 Bits, SCID-8 Bits (Refer to Table 8.1.2.5-1), and followed by VCID-6 Bits (Refer to Table 8.1.4.1.1-2)).
24-5.3	For the next VCID, repeat the above items (24-5.1 through 24-5.2).		
24-6	For this APID, identify number of packets with SSC discontinuities.	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295. Increment counter by 1 for each gap in the (SSC) number sequence. Note: A gap may exist at the beginning of an APID in a PDS/EDS if one or more missing SSC(s) exist between the last SSC for this APID in the PDS/EDS immediately preceding the current PDS/EDS under construction and the first SSC in the current APID for the PDS/EDS under construction. EDOS does not consider it a gap when the SSC wraps naturally, from 16,383 to 0. If zero, items 24-6.1 through 24-6.10 do NOT exist for an EDS or a PDS.
For this APID, list missing packet SSCs for the PDS and EDS (EDOS does not consider it a gap when the SSC wraps naturally, from 16,383 to 0. Therefore no entry exists here when the SSC wraps naturally.)(Items 24-6.1 through 24-6.10 are NOT applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.)			
24-6.1	For this APID gap, identity of the first Missing Packet SSC in the gap.	Unsigned Integer 4 Bytes	Range -> 0 through 16,383 Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.
24-6.2	For this APID gap, index (byte offset) into the data set to the missing packet (points to packet, with the same APID, that is immediately after the SSC gap in the data set).	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power less 1) 0 equates to the first byte/octet of the first packet in the entire PDS/EDS (This is an index into the entire Data Set, NOT an index into a file containing only part of the data set). This index points to the first byte of the packet. Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
24-6.3	For this APID gap, number of packet SSCs missed within the gap.	Unsigned Integer 4 Bytes	Range -> 1 through 4,294,967,295 Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.
24-6.4	For this APID gap, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of the packet, with the same APID, that is immediately before the SSC gap in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2. Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.
24-6.5	For this APID gap, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of the packet, with the same APID, that is immediately after the SSC gap in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2. Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument,.
24-6.6	For this APID gap, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
24-6.7	For this APID gap, ESH date and time annotation of the packet, with the same APID, that is immediately before the SSC gap in the data set.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument. This is a copy of the time of receipt from within the ESH that belongs with the packet.
24-6.8	For this APID gap, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
24-6.9	For this APID gap, ESH date and time annotation of the packet, with the same APID, that is immediately after the SSC gap in the data set.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument. This is a copy of the time of receipt from within the ESH that belongs with the packet.
24-6.10	For the next missing packet SSC (gap), repeat the above items (24-6.1 through 24-6.9) (when applicable). Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.		
	For this APID, list packets containing EDOS generated fill data		
24-7	For this APID, number of entries in list of packets containing EDOS generated fill data	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295. If zero, items 24-7.1 through 24-7.4 will not be present. Count of packets containing EDOS generated fill data, for this APID.
24-7.1	For this APID, SSC of packet containing EDOS generated fill data (SSC from CCSDS packet)	Unsigned Integer 4 Bytes	Range -> 0 through 16,383
24-7.2	For this APID, index (byte offset) into the data set to the fill packet.	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power less 1) 0 equates to the first byte/octet of the first packet in the entire PDS/EDS (This is an index into the entire Data Set, NOT an index into a file containing only part of the data set). This index points to the first byte of the packet.
24-7.3	For this APID, index to the first fill octet for the above packet	Unsigned Integer 4 Bytes	Range -> 0 through 1,000 (Note: 0 equates to the first octet of the application data.)
24-7.4	For the next fill packet identification, repeat the above items (24-7.1 through 24-7.3) (if applicable).		
24-8	For this APID, count of octets of EDOS generated fill data	Unsigned Integer 8 Bytes	Range -> 0- through (2 to the 64th power less 1) Count of octets of EDOS generated fill data (within the entire data set), for this APID.
24-9	For this APID, count of packets that had discrepancies between packet header length item and actual packet length.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Note: Counter increments whenever the packet length identified in the packet header was different than the actual packet's length during Return Link Service Processing. If zero, items 24-9.1 and 24-9.2 will not be present.
24-9.1	For this APID, SSC of packet with length discrepancy	Unsigned Integer 4 Bytes	Range -> 0 through 16,383
24-9.2	For the next packet with length discrepancy, repeat above item (24-9.1)(if applicable)		

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
24-10	For this APID, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of first packet in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2.
24-11	For this APID, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of last packet in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2.
24-12	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
24-13	For this APID, ESH date and time annotation of first packet in the data set.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). This is a copy of the time of receipt from within the ESH that belongs to the first packet For this APID in the acquisition session.
24-14	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
24-15	For this APID, ESH time and date annotation of last packet in the data set.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). This is a copy of the time of receipt from within the ESH that belongs to the last packet For this APID in the acquisition session.
24-16	For this APID, count of packets from VCDUs with errors corrected by R-S decoding	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Number of VCDUs corrected by Reed Solomon (R-S) (Grade 2 service for AM-1. This count is incremented whenever the ESH item - R-S Error Control Flag contains a zero and then the ESH item -Source VCDU Error Decode Results contains a value other than zero.)
24-17	For this APID, count of packets in the data set.	Unsigned Integer 4 Bytes	Range -> 1 through 4,294,967,295

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
24-18	For this APID, size (in octets)	Unsigned Integer 8 Bytes	Range -> 1 through (2 to the 64th power less 1)
24-19	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
24-20	For the next APID in the PDS/EDS, repeat the above items (24-1 through 24-19) (if applicable)		
Identify files that store this PDS/EDS			
25	For this PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
25-1	For this PDS/EDS, Number of files that this PDS/EDS resides in.	Unsigned Integer 1 Byte	Range -> 2 through 255. The first file only contains the PDS Construction Record, and the remaining files contain the CCSDS Path SDU packets.
25-2	File Name for a PDS or an EDS	ASCII 40 Bytes	Value -> Refer to Table 8.1.2.10-1 Identifies a File Name that stores a part of a PDS or an EDS.
25-3	For this file, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
25-4	For this file, Identify number of APIDs in the file.	Unsigned Integer 1 Byte	Value -> 1 through 3; one-up counter. Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.1	For the APID, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0). Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.2	APID (SCID and APID) in the data set.	Unsigned Integer 3 Bytes	SCID and APID (SCID-8 Bits (Refer to Table 8.1.2.5-1), Fill Bits-5 Bits, and followed by APID-11 Bits (Refer to Table 8.1.4.1.1-1)). Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.3	For this APID, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of first packet with this APID in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2. Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
25-4.4	For this APID, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of last packet with this APID in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2. Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.5	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0). Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.6	For the next APID, repeat the above items (25-4.1 through 25-4.5)		
25-5	For this PDS/EDS, for the next File Name, repeat the above items (25-2 through 25-4.6) (if applicable)		

8.1.2.8 PDS/EDS Identification

The PDS/EDS identification data structure, in ASCII format, used to uniquely identify a PDS and an EDS is shown in Table 8.1.2.8-1 below. The time item within this identification records when the PDS/EDS was created by EDOS.

Table 8.1.2.8-1. PDS/EDS Identification

Item No.	Name	Format & Size	Data Characteristics
1	Data Structure Identification Character	ASCII 1 Byte	Value -> "E" or "P"; Identifies the data structure as an EDS or PDS.
2	First APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on left).
3	Second APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a second APID is not present in the data set, this item will contain a value of "AAAAAAA".

Table 8.1.2.8-1. PDS/EDS Identification (Continued)

Item No.	Name	Format & Size	Data Characteristics
4	Third APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a third APID is not present in the data set, this item will contain a value of "AAAAAAA".
5	Time of EDS/PDS creation	ASCII 11 Bytes	Value -> Refer to Table 8.1.2.6-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data set was created).
6	Numeric Identification	ASCII 1 Byte	Range -> "0" through "9", one-up, wrap around, data set counter. EDSs and PDSs utilize the same counter. This number aids in distinguishing the order of data set creation; provides uniqueness to the identification; and relieves the burden of resetting a counter every second to ensure no two identifications are the same.
7	Fill/Spare, reserved for future use.	ASCII 2 Bytes	Value -> "00"
A PDS/EDS Identification contains 36 bytes. Examples: P04202890420291AAAAAAA95030231459600 and E0420193AAAAAAAAAAAAAA95133235959900			

8.1.2.9 Signal File Naming Convention

The signal file name consists of the extension ".XFR" appended to the name of the data file referenced by the signal file, including its file name extensions. See the description of the signal file in Section 3.5 of this ICD.

The following example illustrates a signal file for a PDS.

Table 8.1.2.9-1. Signal File Name Convention

Item No.	Name	Format & Size	Data Characteristics
1	Name of file transferred via FTP	ASCII String	For example, A PDS File Name contains a total of 40 Bytes. Example: P04202890420291AAAAAAA95030231459001.PDS
2	Signal File File Name Extension	ASCII 4 Bytes	Value->".XFR"
A PDS Signal File Name contains a total of 44 Bytes. Example: P04202890420291AAAAAAA95030231459001.PDS.XFR			

8.1.2.10 File Name Convention for a PDS and an EDS

File names that identify files storing a PDS or an EDS contain all ASCII characters in the format shown in Table 8.1.2.9-1 below. Content of the items for the APIDs, time, and Numeric Identification are an exact copy of the fields in the corresponding PDS/EDS Identification. EDOS will ensure that the file name in the destinations directory is unique.

Table 8.1.2.10-1. File Name Convention for a PDS and an EDS

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> "E" or "P"; Identifies the file as containing an EDS or a PDS.
2	First APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on left).
3	Second APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1, followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a second APID is not present in the data set, this item will contain a value of 'AAAAAAA'.

Table 8.1.2.10-1. File Name Convention for a PDS and an EDS (Continued)

Item No.	Name	Format & Size	Data Characteristics
4	Third APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a third APID is not present in the data set, this item will contain a value of 'AAAAAAA'.
5	Time of EDS/PDS creation	ASCII 11 Bytes	Value -> Refer to Table 8.1.2.6-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data set is created). This time is a copy of the GMT time in the PDS/EDS Identification in Table 8.1.2.8-1 from when the PDS/EDS was created.
6	Numeric Identification	ASCII 1 Byte	Range -> "0" through "9", one-up, wrap around, data set counter. PDSs and EDSs utilize the same counter. This numeric identification is a copy of the numeric identification in the PDS/EDS Identification in Table 8.1.2.8-1 from when the PDS/EDS was created. This number aids in distinguishing the order of data set creation during the day and provides uniqueness to the file name.
7	Unique File number.	ASCII 2 Bytes	Range -> "00" through "99" Every PDS and EDS (always) resides in two or more Files. The first File (number "00") always stores the Construction Record by itself, and the one or more time ordered File(s) thereafter sequentially store the Path SDUs (file number(s) "01" through "99").
8	File Name Extension	ASCII 4 Bytes	Value -> ".PDS" or ".EDS"
PDS and EDS File Names contain a total of 40 Bytes. Examples: P04202890420291AAAAAAA95030231459001.PDS and E0420193AAAAAAAAAAAAAA95133235959100.EDS			

8.1.2.11 File Name Convention for a PDS and an EDS Delivery Record

When EDOS stores a PDS, or an EDS, Delivery Record in a DAAC's directory, the file name storing the record has the format identified in Table 8.1.2.11-1. Content of the items for the APIDs, GMT time, and Numeric Identification are an exact copy of the fields in the corresponding PDS/EDS Identification. EDOS will ensure that the file name in the destinations directory is unique.

Table 8.1.2.11-1. File Name Convention for a PDS and an EDS Delivery Record

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> "X" or "Y" ; "X" identifies the file as a PDS Delivery Record and "Y" identifies the file as an EDS Delivery Record.
2	First APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left).
3	Second APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a second APID is not present in the data set, this item will contain a value of "AAAAAAA".
4	Third APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a third APID is not present in the data set, this item will contain a value of "AAAAAAA".
5	Time of EDS/PDS Creation	ASCII 11 Bytes	Value -> Refer to Table 8.1.2.6-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data set was created).
6	Numeric Identification	ASCII 1 Byte	Range -> "0" through "9", one-up, wrap around, data set counter. PDSs and EDSs utilize the same counter. This numeric identification is a copy of the numeric identification in the PDS/EDS Identification in Table 8.1.2.8-1 from when the PDS/EDS was created. This number aids in distinguishing the order of data set creation during the day and provides uniqueness to the file name.
7	File Name Extension	ASCII 4 Bytes	Value -> ".PDR" or ".EDR"
A File name for an EDS/PDS Delivery Record contains a total of 38 Bytes. Examples: X042030904203110420310950302314591.PDR and Y0420193AAAAAAAAAAAAAA953652359590.EDR			

8.1.2.12 File Name Convention for the PDS/EDS Acceptance Notification

When a DAAC stores a PDS/EDS Acceptance Notification in an EDOS directory via FTP, the file name storing the message has the format defined in Table 8.1.2.12-1. The sender of this message ensures that the file name in EDOS's directory is unique (i.e. doesn't have a time field with the same second field).

Table 8.1.2.12-1. File Name Convention for the PDS/EDS Acceptance Notification

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> "I" identifies the PDS/EDS Acceptance Notification
2	Time of File Creation	ASCII 11 Bytes	Value -> Refer to Table 8.1.2.6-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data was placed within the destination's directory).
3	File Name Extension	ASCII 4 Bytes	Value -> ".PAN" or ".EAN"
File names contains a total of 16 Bytes. Examples: I95030231459.PAN and I95365235959.EAN			

8.1.2.13 File Name Convention for a PDS Physical Media Unit Delivery Record

When EDOS stores a PDS Physical Media Unit Delivery Record as the first file on a physical media unit, the file name storing the record has the following format. EDOS will ensure that each file name is unique.

Table 8.1.2.13-1. File Name Convention for a PDS Physical Media Unit Delivery Record

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> "D" means PDS Physical Media Unit Delivery Record.
2	Bar Code Label/Serial Tape Number (matches the Serial Number on the physical media unit label).	ASCII 6 Bytes	Values-> First character always equals: "Z" for EDOS Archived Physical Media Units. The remaining 5 alphanumeric characters in positions 2 through 6 (contain the letters A through Z and 0 through 9), provide the remaining uniqueness for this Physical Media Unit Identification.
3	File Name Extension	ASCII 4 Bytes	Value -> ".MDR"
A File name for an PDS Physical Media Delivery Record contains a total of 11 Bytes. Examples: DZBC012.MDR and DZ9ZA49.MDR			

8.1.3 Operations Management Data/Operations Management Test Data

The following paragraphs define the content of the Operations Management Data and Operations Management Test Data (Operations Management Data with the "Test Flag" set). Distinction between Operations Management Data and Operations Management Test Data lies entirely with the test flag being set or not set in the EDOS Ground Message Header.

8.1.3.1 PDS and EDS Delivery Records

After files for a PDS or an EDS are successfully transferred to a DAAC, EDOS sends the PDS/EDS Delivery Record to the DAAC providing notification of the data set's presence. The EDOS Ground Message Header identifies whether this message is a PDS or an EDS Delivery Record.

The PDS and EDS Delivery Records (see Table 8.1.3.1-1) consist of an EDOS Ground Message Header, an Exchange Data Unit Label, a PDS/EDS Delivery Record Label, and PDS/EDS Delivery Record PVL Statements.

Table 8.1.3.1-1. PDS and EDS Delivery Record

Item No.	Name	Format & Size	Data Characteristics
1	EDOS Ground Message Header	Integer Formatted 24 Bytes	Value-> Refer to Table 8.1.2.1-1 for a definition of the EDOS Ground Message Header.
2	Exchange Data Unit Label	ASCII 20 Bytes	Value-> Refer to Table 8.1.3.1-2 for a definition of this label.
3	PDS/EDS Delivery Record Label	ASCII 20 Bytes	Value -> Refer to Table 8.1.3.1-3 for a definition of this label.
4	PDS/EDS Delivery Record PVL Statements	PVL Variable	Value -> Refer to Table 8.1.3.1-4 for a definition of the PVL statements.

Table 8.1.3.1-2. Exchange Data Unit Label*

Item No.	Name	Format & Size	Data Characteristics
1	Control Authority ID	ASCII 4 Bytes	Value -> '0000' Note: This item is part of the DAAC required format.
2	Version ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
3	Class ID	ASCII 1 Byte	Value ->'Z' Class of label Note: This item is part of the DAAC required format.
4	S1	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
5	S2	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
6	Data Description	ASCII 4 Bytes	Value ->'0001' EDU Indicator
7	Delimitation Parameter	ASCII 8 Bytes	Value -> less than or equal to '1048576' Length in ASCII of the PDS/EDS Delivery Record Label and PVL statements, including white space
Exchange Data Unit Label contains 20 bytes			

*Not used by ECS

Table 8.1.3.1-3. PDS/EDS Delivery Record Label*

Item No.	Name	Format & Size	Data Characteristics
1	Control Authority ID	ASCII 4 Bytes	Value -> '0000' Note: This item is part of the DAAC required format.
2	Version ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
3	Class ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
4	S1	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
5	S2	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
6	Data Description	ASCII 4 Bytes	'0000 Value -> '0000' Note: This item is part of the DAAC required format.'
7	Delimitation Parameter	ASCII 8 Bytes	Value -> less than or equal to '1048576' Length in ASCII of PVL Statements for the PDS/EDS Delivery Record parameters, including white space
PDS/EDS Delivery Record Label contains 20 Bytes			

*Not used by ECS

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
1	ORIGINATING_SYSTEM	Originator of the PDS/EDS Delivery Record (See Note) (Defined in the EDOS-DAAC OA)	ASCII 20 Bytes	EDOS Processor Identifier
2	CONSUMER_SYSTEM	Destination of the PDS/EDS Delivery Record (See Note) (Defined in the EDOS-DAAC OA)	ASCII 20 Bytes	ECS Processor Identifier

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
3	DAN_SEQ_NO	Sequence number assigned by originating system (1 up number starting from 0 and wrapping after 9,999,999,999)	ASCII 10 Bytes	≤ 9999999999
4*	PRODUCT_NAME	Name (i.e., type) of Product which defines the collection of files comprising of the product.	ASCII 25 Bytes	'PDS' or 'EDS'
5*	MISSION	Mission or investigation which includes the sensors producing the data of this notice	ASCII 20 Bytes	'AM-1'
6	TOTAL_FILE_COUNT	Total number of files transferred, a data set has a minimum of two files	ASCII 4 Bytes	0002 through 9999
7	AGGREGATE_LENGTH	Total number of bytes to transfer (sum for all files)	ASCII 10 Bytes	< 9999999999
8	EXPIRATION_TIME	Not used	Fixed String	999-99-99T99:99:99Z, where T and Z are literals
9	OBJECT	Start of file group parameters (not repeated in the PDS/EDS Delivery Record since a record refers to only one PDS)	ASCII 10 Bytes	'FILE_GROUP'
9-1	DATA_SET_ID	Data set identification number as assigned by EDOS. (Refer to Table 8.1.2.8-1)	ASCII 36 Bytes	ASCII representation of the Data Set Identification Number (alphanumeric)

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
9-2	DATA_TYPE	Data type for this APID	ASCII 20 Bytes	See Table 8.1.3.1-5. DATA_TYPE value applies to the sole APID or the first APID of a multiple APID data set.
9-3*	DESCRIPTOR	Name of sensor or instrument that collected the data	ASCII 60 Bytes	'NOT USED'
9-4*	DATA_VERSION	'Not Used'	ASCII 2 Bytes	'00'
9-5	NODE_NAME	Name of destination computer on which the data set files reside (Defined in the EDOS-DAAC OA)	ASCII 64 Bytes	e.g. 'ecs.gsfc.nasa.gov'
9-6	OBJECT	Start of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'
9-6.1	DIRECTORY_ID	File directory name (i.e., path name) (Directory defined in the EDOS-DAAC OA)	ASCII 256 Bytes,	e.g. '/EDOS/Level 0/'
9-6-2	FILE_ID	File name (Refer to Table 8.1.2.10-1 for the file name)	ASCII 256 Bytes,	file name in ASCII
9-6.3	FILE_TYPE	Type of file contents; metadata if PDS/EDS construction record, or DATA	ASCII 20 Bytes	If the file has the data set's construction record, then this value = 'METADATA'. If the file has CCSDS packets then this value = 'DATA'

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
9-6.4	FILE_SIZE	Length of file in bytes	ASCII 10 Bytes	Maximum is 2 Gigabytes
9-6.5	END_OBJECT	End of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'
9-7*	BEGINNING_DATE/TIME	ISO Start time of transmitting the data set	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals
9-8*	ENDING_DATE/TIME	ISO End time of transmitting the data set	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals
9-9	END_OBJECT	End of file group (not repeated since the PDS/EDS Delivery Record only refers to one PDS/EDS)	ASCII 10 Bytes	'FILE_GROUP'
Note: Each processor must have a unique identifier.				

*Not used by ECS

Table 8.1.3.1-5. DATA_TYPE Values

Instrument Identification/ Operation Mode	APID	DATA_TYPE Value
Merged H/K	x'1'	AM1HK
Health & Safety	x'2'	AM1HS
Diagnostic	x'3'	AM1DIAG1
Ancillary	x'4'	AM1ANC
Standby	x'5'	AM1ST
Diagnostic	x'6'	AM1DIAG2
MODIS	x’40’	MOD000
MODIS	x’41’	MOD001
MODIS	x’42’	MOD002
MODIS	x’43’	MOD003

Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID	DATA_TYPE Value
MODIS	x'44'	MOD004
MODIS	x'45'	MOD005
MODIS	x'46'	MOD006
MODIS	x'47'	MOD007
MODIS	x'48'	MOD008
MODIS	x'49'	MOD009
MODIS	x'4A'	MOD010
MODIS	x'4B'	MOD011
MODIS	x'4C'	MOD012
MODIS	x'4D'	MOD013
MODIS	x'4E'	MOD014
MODIS	x'4F'	MOD015
MODIS	x'50'	MOD016
MODIS	x'51'	MOD017
MODIS	x'52'	MOD018
MODIS	x'53'	MOD019
MODIS	x'54'	MOD020
MODIS	x'55'	MOD021
MODIS	x'56'	MOD022
MODIS	x'57'	MOD023
MODIS	x'58'	MOD024
MODIS	x'59'	MOD025
MODIS	x'5A'	MOD026
MODIS	x'5B'	MOD027
MODIS	x'5C'	MOD028
MODIS	x'5D'	MOD029
MODIS	x'5E'	MOD030
MODIS	x'5F'	MOD031
MODIS	x'60'	MOD032
MODIS	x'61'	MOD033
MODIS	x'62'	MOD034
MODIS	x'63'	MOD035
MODIS	x'64'	MOD036

Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID	DATA_TYPE Value
MODIS	x'65'	MOD037
MODIS	x'66'	MOD038
MODIS	x'67'	MOD039
MODIS	x'68'	MOD040
MODIS	x'69'	MOD041
MODIS	x'6A'	MOD042
MODIS	x'6B'	MOD043
MODIS	x'6C'	MOD044
MODIS	x'6D'	MOD045
MODIS	x'6E'	MOD046
MODIS	x'6F'	MOD047
MODIS	x'70'	MOD048
MODIS	x'71'	MOD049
MODIS	x'72'	MOD050
MODIS	x'73'	MOD051
MODIS	x'74'	MOD052
MODIS	x'75'	MOD053
MODIS	x'76'	MOD054
MODIS	x'77'	MOD055
MODIS	x'78'	MOD056
MODIS	x'79'	MOD057
MODIS	x'7A'	MOD058
MODIS	x'7B'	MOD059
MODIS	x'7C'	MOD060
MODIS	x'7D'	MOD061
MODIS	x'7E'	MOD062
MODIS	x'7F'	MOD063
CERES	x'83'	CER00AF
CERES	x'84'	CERCALAF
CERES	x'85'	CERDIAF
CERES	x'A7'	CER00AA
CERES	x'A8'	CERCALAA
CERES	x'A9'	CERDIAA
MOPITT science	x'C0'	MOP00SCI

Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID	DATA_TYPE Value
MOPITT engineering	x'C1'	MOP00ENG
MOPITT test	x'C2'	MOP00TST
VNIR (1)/observation	x'101'	AST0V1S
VNIR (1)/observation	x'103'	AST0V1SE
VNIR (1)/calibration	x'105'	AST0V1C
VNIR (1)/calibration	x'107'	AST0V1CE
VNIR (1)/test	x'109'	AST0V1TS
VNIR (1)/test	x'10B'	ASTV1TSE
VNIR (2)/observation	x'111'	AST0V2S
VNIR (2)/observation	x'113'	AST0V2SE
VNIR (2)/calibration	x'115'	AST0V2C
VNIR (2)/calibration	x'117'	AST0V2CE
VNIR (2)/test	x'119'	AST0V2TS
VNIR (2)/test	x'11B'	ASTV2TSE
SWIR/observation	x'121'	AST0SS
SWIR/observation	x'123'	AST0SSE
SWIR/calibration	x'125'	AST0SCS
SWIR/calibration	x'127'	AST0SCSE
SWIR/test	x'129'	AST0STS
SWIR/test	x'12B'	AST0STSE
TIR/observation	x'131'	AST0TS
TIR/observation	x'132'	AST0TE
TIR/observation	x'133'	AST0TSE
TIR/calibration	x'135'	AST0TCS
TIR/calibration	x'136'	AST0TCE
TIR/calibration	x'137'	AST0TCSE
TIR/test	x'139'	AST0TTS
TIR/test	x'13A'	AST0TTE
TIR/test	x'13B'	AST0TTSE
MISR/science	x'140'	MISL0DF
MISR/science	x'143'	MISL0CF
MISR/science	x'145'	MISL0BF
MISR/science	x'146'	MISL0AF
MISR/science	x'149'	MISL0AN

Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID	DATA_TYPE Value
MISR/science	x'14A'	MISL0AA
MISR/science	x'14C'	MISL0BA
MISR/science	x'14F'	MISL0CA
MISR/science	x'151'	MISL0DA
MISR/calibration	x'154'	MISCALDF
MISR/calibration	x'157'	MISCALCF
MISR/calibration	x'158'	MISCALBF
MISR/calibration	x'15B'	MISCALAF
MISR/calibration	x'15D'	MISCALAN
MISR/calibration	x'15E'	MISCALAA
MISR/calibration	x'161'	MISCALBA
MISR/calibration	x'162'	MISCALCA
MISR/calibration	x'164'	MISCALDA
MISR/engineering	x'152'	MISL0ENG
MISR/on board calibrator	x'167'	MISL0CAL
MISR/test	x'168'	MISL0TST
MISR/motor	x'169'	MISL0MTR

8.1.3.2 PDS/EDS Acceptance Notification

A DAAC that receives PDS files and accompanying PDS Delivery Records (or the EDS files and accompanying EDS Delivery Records) returns a PDS/EDS Acceptance Notification in acknowledgment of receipt and acceptance of each PDS/PDR or EDS/EDR pair. The DAAC attaches the EDOS Ground Message Header to the Acceptance Notification, and transfers the notification to EDOS.

If for any reason the File Transfer Disposition indicates an error occurred, the DAAC sends a "Problem Report" to EDOS to report the problem as specified in the Operations Agreement.

EDOS stores a PDS, or an EDS, on disk until it is successfully transferred to the DAAC via FTP. At that time, EDOS deletes the PDS from on-line disk storage. EDOS archives the PDS. An EDS is removed from the disk and will cease to exist, since EDOS does not archive EDSs. If a copy of the PDS is requested within an operationally specified number of days of initial production and transmission, the requested PDS will be electronically retransmitted to the requesting DAAC. After the lapse of the operationally

specified number of days, any request from a DAAC for a PDS that is already on tape, will result in EDOS making a copy of the entire archive tape and mailing that tape to the requesting DAAC (Reference paragraph 8.1.4.1.6 of this ICD - EDOS Archive Removable Physical Media Unit Format).

The PDS/EDS Acceptance Notification consists of, in sequence as shown below in Table 8.1.3.2-1, the EDOS Ground Message Header and then the PDS/EDS Acceptance Notification Description

Table 8.1.3.2-1. PDS/EDS Acceptance Notification Structure

Item No.	Name	Format	Data Characteristics
1	EDOS Ground Message Header	Integer Formatted 24 Bytes	Value -> Refer to Table 8.1.2.1-1 for a definition of the EDOS Ground Message Header in Binary Format.
2	PDS/EDS Acceptance Notification Description	Variable	Refer to table 8.1.3.2-2 - PDS/EDS Acceptance Notification Description

Table 8.1.3.2-2. PDS/EDS Acceptance Notification Description

Item No.	Name	Type (Length in Bytes)	Data Characteristics
2-1	Message Type	Unsigned Integer 1 Byte	Value -> 12. PDS/EDS Acceptance Notification
2-2	Message length	Unsigned Integer 3 Bytes	Value -> Greater than 16. Length of PDS/EDS Acceptance Notification excluding the EDOS Ground Message Header
2-3	DRR Sequence No.	Integer 4 bytes	Value -> 0. Note: This item is part of the DAAC required format.
2-4	PDS/EDS Delivery Record Sequence No.	Integer 4 Bytes	Value -> Sequence number assigned by Originating System. Supplied in the PDS/EDS Delivery Record.
2-5	Number of Files	ASCII 4 Bytes	Value -> Total File Count in the PDS/EDS Delivery Record. Supplied in the PDS/EDS Delivery Record.
2-5.1	File Directory	ASCII 256 Bytes	Value -> ASCII string specifying file directory location. Supplied in the PDS/EDS Delivery Record (including FILE_ID, but excluding the null terminator).

Table 8.1.3.2-2. PDS/EDS Acceptance Notification Description (Continued)

Item No.	Name	Type (Length in Bytes)	Data Characteristics
2-5.2	File Name	ASCII 256 Bytes	Value -> File name in ASCII. Supplied in the PDS/EDS Delivery Record (including DIRECTORY_ID, but excluding the null terminator).
2-5.3	File Transfer Disposition	Integer 1 Byte	Value -> 0 = Successful 4 = File Not Found 8 = File Unreadable 9 = Invalid PDS/EDS Construction Record Data 10 = Invalid PDS/EDS Delivery Record Data
2-5.4	Repeat items 2-5.1 through 2-5.3 for each file		

8.1.3.3 PDS Physical Media Unit Delivery Record

Upon request from ECS, EDOS will deliver PDSs from the EDOS archive (see Section 8.1.4.1.6 of this document). These PDSs will be transferred to physical media (D3 tapes) via the TAR utility. The PDS Physical Media Unit Delivery Record (PPMUDR), residing as the first recorded item on a removable physical media unit storing PDS(s), contains: 1) Physical Media Unit Identification (bar code and serial number that matches the bar code and serial number on the exterior of the physical media unit); 2) date and time the physical media unit was generated; and 3) identity of the PDS(s) stored on the media.

No absolute path name will be used in the TAR utility command. A single TAR file shall exist on the physical media.

The PDS Physical Media Unit Delivery Record consists of an Exchange Data Unit Label, a PDS Physical Media Unit Delivery Record Label; and PVL Statements for the PPMUDR.

Table 8.1.3.3-0. Physical Media Unit Delivery Record

Item No.	Name	Format & Size	Data Characteristics
1	Exchange Data Unit Label	ASCII 20 Bytes	Value-> Refer to Table 8.1.3.3-1 for a definition of this label.
2	PDS/EDS Delivery Record Label	ASCII 20 Bytes	Value -> Refer to Table 8.1.3.3-2 for a definition of this label.
3	PDS/EDS Delivery Record PVL Statements	PVL Variable	Value -> Refer to Table 8.1.3.3-3 for a definition of the PVL statements.

Table 8.1.3.3-1. Exchange Data Unit Label*

Item No.	Name	Format & Size	Data Characteristics
1	Control Authority ID	ASCII 4 Bytes	Value -> '0000' Note: This item is part of the DAAC required format.
2	Version ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
3	Class ID	ASCII 1 Byte	Value ->'Z' Class of label Note: This item is part of the DAAC required format.
4	S1	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
5	S2	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
6	Data Description	ASCII 4 Bytes	Value ->'0001' EDU Indicator
7	Delimitation Parameter	ASCII 8 Bytes	Value -> less than or equal to '1048576' Length in ASCII of the PDS Physical Media Unit Delivery Record Label and PVL statements, including white space.
Exchange Data Unit Label contains 20 bytes			

*Not used by ECS

Table 8.1.3.3-2. PDS Physical Media Unit Delivery Record Label*

Item No.	Name	Format & Size	Data Characteristics
1	Control Authority ID	ASCII 4 Bytes	Value -> '0000' Note: This item is part of the DAAC required format.
2	Version ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
3	Class ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
4	S1	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
5	S2	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
6	Data Description	ASCII 4 Bytes	'0000 Value -> '0000' Note: This item is part of the DAAC required format.
7	Delimitation Parameter	ASCII 8 Bytes	Value -> less than or equal to '1048576' Length in ASCII of the PVL statements, including white space.
PDS Physical Media Unit Delivery Record Label contains 20 Bytes			

*Not used by ECS

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
1*	RECORD_TYPE	Unique Identifier for the PDS Physical Media Unit Delivery Record	ASCII 4 Bytes	'0023' for operational PPMUDR '0151' for test PPMUDR
2*	CONSUMER_SYSTEM	For the EDOS Archive physical unit , identify 'ARCHIVE'.	ASCII 20 Bytes	'ARCHIVE'
3*	SOFTWARE_VERSION	Not used	ASCII 8 Bytes	'NOT USED'

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
4*	BAR_CODE_ID	Bar code serial number on this physical unit. The first character signifies "Z" for an EDOS Archive physical unit. The remaining 5 positions contain alphanumeric characters.	ASCII 6 Bytes	1st character is alphabetic, the rest are alphanumeric.
5*	COMPLETION_DATE/TIME	ISO date and time of completion of this physical media unit. (Time when recording terminated).	Fixed string 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T & Z are literals
6*	CONSTRUCTION_FILE	Not used for an EDOS Archive physical unit.	ASCII 13 Bytes	'NOT USED' for the EDOS Archive physical unit.
7	TOTAL_FILE_COUNT	Total number of files on this media	ASCII 4 Bytes	0002 through 9999
8*	PDS_COUNT	Total number of PDSs on this physical medium	ASCII 4 Bytes	≤ 9999
8-1	OBJECT	Start of PDS specifications (repeat for each PDS)	ASCII 10 Bytes	'FILE_GROUP'
8-2	DATA_SET_ID	EDOS Assigned Identification to the PDS (Refer to Table 8.1.2.8-1)	ASCII 36 Bytes	PDS Identification
8-3	DATA_TYPE	Data type for this PDS	ASCII 20 Bytes	See Table 8.1.3.1-5. DATA_TYPE value applies to the sole APID or the first APID of a multiple APID data set.

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
8-4*	FIRST_PACKET_TIME	C1 effectivity: Item is not used for the EDOS Archive physical unit C2 effectivity: For this PDS, CCSDS binary timecode (CCSDS Day Segmented Time Code/Spacecraft Time Format) from the secondary header of the first packet in the PDS (Refer to Table 8.1.4.1.1-2)	ASCII 27 Bytes	C1 effectivity: For the EDOS Archive physical unit, the value is 'NOT USED' C2 effectivity: CCSDS Time Format yyyy-mm-ddThh:mm:ss.dddddd Z
8-5*	LAST_PACKET_TIME	C1 effectivity: Item is not used for the EDOS Archive physical unit C2 effectivity: For this PDS, CCSDS binary timecode (CCSDS Day Segmented Time Code/Spacecraft Time Format) from the secondary header of the first packet in the PDS (Refer to Table 8.1.4.1.1-2)	ASCII 27 Bytes	C1 effectivity: For the EDOS Archive physical unit, the value is 'NOT USED' C2 effectivity: CCSDS Time Format yyyy-mm-ddThh:mm:ss.dddddd Z
8-6*	PACKET_COUNT	Item is not used for the EDOS Archive physical unit.	ASCII 8 Bytes	For the EDOS Archive physical unit, the value is 'NOT USED'
8-7*	OCTET_COUNT	Item is not used for the EDOS Archive physical unit.	ASCII 11 Bytes	For the EDOS Archive physical unit, the value is 'NOT USED'
8-8*	TEST_FLAG	Item contains a default value of 'F' for the EDOS Archive physical unit.	ASCII 1 Byte	For the EDOS Archive physical unit, the value is 'F'

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
8-9*	APID_COUNT	Number of APIDs in this PDS	ASCII 2 Bytes	≤ 3 ECS data will have exactly one APID per PDS. ASTER data may have up to three APIDs per PDS. Archive tape may contain both ECS and non-ECS PDSs.
8-10*	OBJECT	Start of APID specification (repeat for each APID)	ASCII 9 Bytes	'APID_SPEC'
8-10.1*	APID_IN_PDS	Decimal value of the EDOS APID (first 3 bytes contain the SCID (Refer to Table 8.1.2.5-1) and the last 4 bytes contain the APID (Refer to Table 8.1.4.1.1-1)).	ASCII 7 Bytes	≤ 9999999
8-10.2*	END_OBJECT	End of APID Specification	ASCII 9 Bytes	'APID_SPEC'
8-11*	FILE_COUNT	Number of files occupied by this PDS	ASCII 4 Bytes	≤ 9999
8-11.1	OBJECT	Start of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'
8-11.2*	DIRECTORY_ID	Not used	ASCII 255 Bytes including FILE_ID, but excluding null terminator)	'NOT USED'
8-11.3	FILE_ID	File name (Refer to Table 8.1.2.10-1)	ASCII 255 Bytes including DIRECTORY_ID, but excluding null terminator)	file name in ASCII

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
8-11.4	FILE_TYPE	Type of file contents; metadata if PDS/EDS construction record, or DATA	ASCII 20 Bytes	If the file has the data set's construction record, then this value = 'METADATA'. If the file has CCSDS packets then this value = 'DATA'
8-11.5	FILE_SIZE	Length of file in bytes	ASCII 10 Bytes	≤ 9999999999
8-11.6	END_OBJECT	End of file specification	ASCII 9 Bytes	'FILE_SPEC'
8-12	END_OBJECT	End of PDS specification	ASCII 10 Bytes	'FILE_GROUP'

*Not used by ECS

8.1.3.4 EDOS Archive PDS Physical Media Unit Delivery Letter

An EDOS Archive PDS Physical Media Unit Delivery Letter, in hardcopy, is shipped along with the EDOS archived removable physical media unit containing the requested data. Table 8.1.3.4-1 defines the contents of the letter. This letter is generated through automation to minimize the possibility of operator error in documenting the location and identification of the requested PDS(s). PDSs are referenced by their PDS Identification. When copies of the archived physical media units (tapes) that contain the requested PDS(s) are made, a separate letter is generated for each tape. Then the tapes and letters are packaged and shipped to the requester.

Table 8.1.3.4-1. Archive PDS Physical Media Unit Delivery Letter Contents

Field Name	Meaning
Message Type	"Archive PDS Physical Media Unit Delivery Letter"
Originating System	EDOS
Destination System	Shipment recipient (DAAC name). See Table 8.1.2.3-1 for the list of sources.
Reference Request Sequence Number	Request sequence number that caused the generation of this physical medium.
Number of requested data sets on this physical medium	The number of requested data sets that are on this medium.
Requested Data Sets IDs	A list of the requested Data Set IDs that are on this physical medium
Data set ID	The ID of the Data Set ID (Refer to Table 8.1.2.8-1)that is in the attached physical medium, repeated for each data set.
Data set level	Level 0 or Level 1A, repeated for each data set. if Level 1A, the ID of the missing Level 0 data set is still supplied with the understanding that the L1A data set will probably contain data from various L0 data sets.

8.1.3.5 DEDS Packing List

The DEDS Packing List, in hardcopy, shall be included with the DEDS removable physical media unit. In addition to the hardcopy packing list, the DEDS Packing List shall be stored as a file on the DEDS physical media unit (D3 tape). If multiple tapes are required for the requested PDS(s), the Packing List shall only be stored on the first of the tape series. Therefore, when EDOS gets a DEDS shipment, the first record on the first tape is the DEDS Packing List, the second record is the DEDS Media Description File, followed by Data Records (PDS). The "first" record of the second tape of a DEDS shipment (if there is a second tape) will be the DEDS Media Description File, followed by the Data Records. Only the first tape will have the packing list as the first record. The tape(s) and Packing List are packaged and shipped to the requester.

Table 8.1.3.5-1 defines the contents of a Packing List, and Paragraph 8.1.3.5.1 provides a sample of a DEDS Packing List.

Table 8.1.3.5-1. DEDS Packing List Contents

Content Category	Description	Type	Format/ Max Size (bytes)	Value or Content Category: Value
DELIVERY LETTER PREAMBLE	Provide descriptor of media delivery including ECS requested ID and number of media	Variable text	ASCII (No Max)	see example
[blank line]				
[blank line]				
MEDIAID	Volume ID (Bar code) (Repeat for each media object)	Variable String	ASCII (8 Bytes)	'MediaId:<value> [2]
[blank line]				
MEDIA	Media number within request (Indented) (Repeat for each media object)	Variable String	Integer (4 Bytes)	*** on Media Number 1 (of 1) contains:'
[blank line]				
[blank line]				
GRANULE UR	Indicates start of a data granule. GranuleUR is the ECS UR for that data granule UR. (Repeat for each granule.) (Indented.)	Variable String	ASCII (334 Bytes including 325 Bytes for GranuleUR) [1]	'Granule: <GranuleUR>'
[blank line]				
ESDT	Specifies the short name of the data's Earth Science Data Type. (Repeat for each granule.) (Indented.)	Variable String	ASCII (14 Bytes including 8 Bytes for the ESDT name) [1]	'ESDT: <Data Type>' See Table 8.1.3.1-5 for valid Data Type
[blank line]				
[blank line]				
FILES START INDICATOR	Detailed information on each file contained within the identified granule in sequential order.	Fixed String	ASCII (6 Bytes)	Files:
FILENAME	The filename for a file in the present granule. (Repeat for each file in present granule.) (Indented.)	Variable String	ASCII (256 Bytes)	'Distribution File Name: <name>'

Table 8.1.3.5-1. DEDS Packing List Contents (Continued)

Content Category	Description	Type	Format/ Max Size (bytes)	Value or Content Category: Value
FILESIZE	The file's size in Bytes (Repeat for each file in present granule.) (Indented.)	Variable String	ASCII (8 Bytes)	'Size: <size>'
ESTIMATED SIZE	The estimated size the file is expected to consume on the media. On Tape (Indented)	Variable String	Real (8 Bytes)	'Estimate Size: <estimate size>
COMPRESSION	Indicates if a file compression Algorithm has been applied (Repeat for each file in present granule.) (Indented.)	Variable String	Integer (4 Bytes)	Compression Status: <value> Possible Values: None, UNIXCompression, GZIP.
[blank line]				

Note 1. This field length includes a content category, a colon, 1 blank, and a value string.

Note 2. Angle brackets (< and >) enclose information to be supplied by ECS at distribution time.

Note 3. Size does not exceed a total of 256 bytes for FILENAME. Size limit includes the null terminator.

8.1.3.5.1 Sample Packing List

DEDS Packing List Contents

"This set of tapes was produced using TAR with no compression algorithms on the TAR results. File compression status is indicated in the file specific information below. Once you extract the files from the tape(s), they are ready to use. A DEDS Packing List (named "PACKING.LST.<requestID> in all caps) is provided on the first tape. Note that no TAR file spans more than one tape: you should never be prompted to load additional tapes other than the one you are extracting files from. Data was written using the UNIX TAR command to these tapes. To recover data use the following steps:

1. **Move to the directory where you wish the files to reside.**
2. **Use TAR with the x option to retrieve files.**

Specifying a blocking factor is not necessary. Consult your O/S documentation on using TAR to extract specific files. Here are two examples you can use:

tar xvf /dev/tape PACKING.LST.<requestID>.

This extracts the DEDS Packing List out of the first tape onto the current directory (/dev/tape is the assumed tape device name).

tar xvf /dev/tape\n.

This extracts everything from the current tape part onto the current directory.

Check to make sure that the stream is OK. If it is not, log a message and return a failed status.

MediaId: <ECS supplied bar code>

***** on Media Number 1 (of n) contains:**

Granule:
UR:10:DsShESDTUR:UR:15:DsShSciServerUr:9athabasca:18:Science:MISL011:1302

ESDT: MISL0AN

Files:

Distribution File Name:
P0420289AAAAAAAAAAAAAA95030231459000.PDS

Size: 33997

Estimated Size: 4096

Compression Status: none

Distribution File Name:
P0420289AAAAAAAAAAAAAA95030231459001.PDS

Size: 4

Estimated Size: 36864

Compression Status: none

Distribution File Name:
P0420289AAAAAAAAAAAAAA95030231459002.PDS

Size: 4

Estimated Size: 36864

Compression Status: none

8.1.3.6 DEDS Media Description File

A DEDS Media Description File, resides on each DEDS physical media unit (D3 tape) and lists all the files on that tape. If the requested PDSs span multiple tapes, each individual tape will contain a DEDS Media Description File describing only the files on that individual tape.

The DEDS Media Description File is an ASCII file composed of a series of text strings. The ASCII file has one text string line for each file contained on the tape. Each line has the information described in Table 8.1.3.6-1. Each field in the text string is separated by a single blank space. Paragraph 8.1.3.6.1 provides a sample Media Description File.

Table 8.1.3.6-1. Media Description File Contents

Field Name	Description	Type	Format/Max Size (bytes)	Value or Content Category: Value
Unique file name	This is the name that the ECS Server uses to uniquely identify the file generated by the request. This is for internal use within the subsystem	Variable String	ASCII (256 Bytes)	
Requested file name	This is the name of the file the requester actually ordered.	Variable String	ASCII (256 Bytes)	
File size	The size in bytes of the identified file.	Variable String	Integer (4 Bytes)	
Data source	This will be either an “L” or “C”, “L”inked from the archive read only cache or “C”opied from some other source, such as the ECS server created metadata file or the ECS server subset file	Fixed String	ASCII (1 Byte)	
Compression type	This indicates the current compression type. The supported type is UNIX compression.	Variable String	Integer (4 Bytes)	

8.1.3.6.1 Sample Media Description File

Unique file name: staging.dat

Requested file name: stagnin.dat.unique

File size: 343

Data source: C

Compression type: gzip

8.1.4 Mission Data/Mission Test Data

The following paragraphs define the content of the Mission Data and the Mission Test Data (Mission Data with the "Test Flag" set). The distinction between Mission Data and a Mission Test Data lies entirely with the test flag being set or not set in the PDS and EDS Construction Records.

8.1.4.1 EDOS Mission Data

The following paragraphs define the EDOS data structures for Mission Data/Mission Test Data.

8.1.4.1.1 Path Service EDU

The Spacecraft returns Version 1 CCSDS Packets through the space network and ground terminals to EDOS. EDOS demultiplexes the CCSDS packets from the VCDUs designated by management information to contain multiplexed packets. The resulting packet is the Path Service Data Unit (SDU). EDOS builds PDSs and EDSs that contain these Path SDUs.

Path Service (Reference Paragraph 2.1.1 of this ICD, Applicable Document 8 - Paragraph 6.1.1 and Paragraph 2.1.2 Reference Document 4 - Paragraphs 2.3.1.2.a and 3.3.3.a) transfers variable-length application-layer science and non-science SDUs (Version-1 CCSDS Packets) through the space network to the ground network. Each SDU contains a delimited string of octets of user application data. The Path service is asynchronous and non-sequence preserving. It's primarily used for transferring, at moderate to very-high data rates, large volumes of structured, delimited data units between fairly static source and destination associations.

The Path SDU (Figure 8.1.4.1.1-1), referred to as a Version-1 CCSDS Packet, consists of a Primary Header, which is 6 octets long, a Secondary Header, which is 9 octets long, and the Application Data which is variable in length.

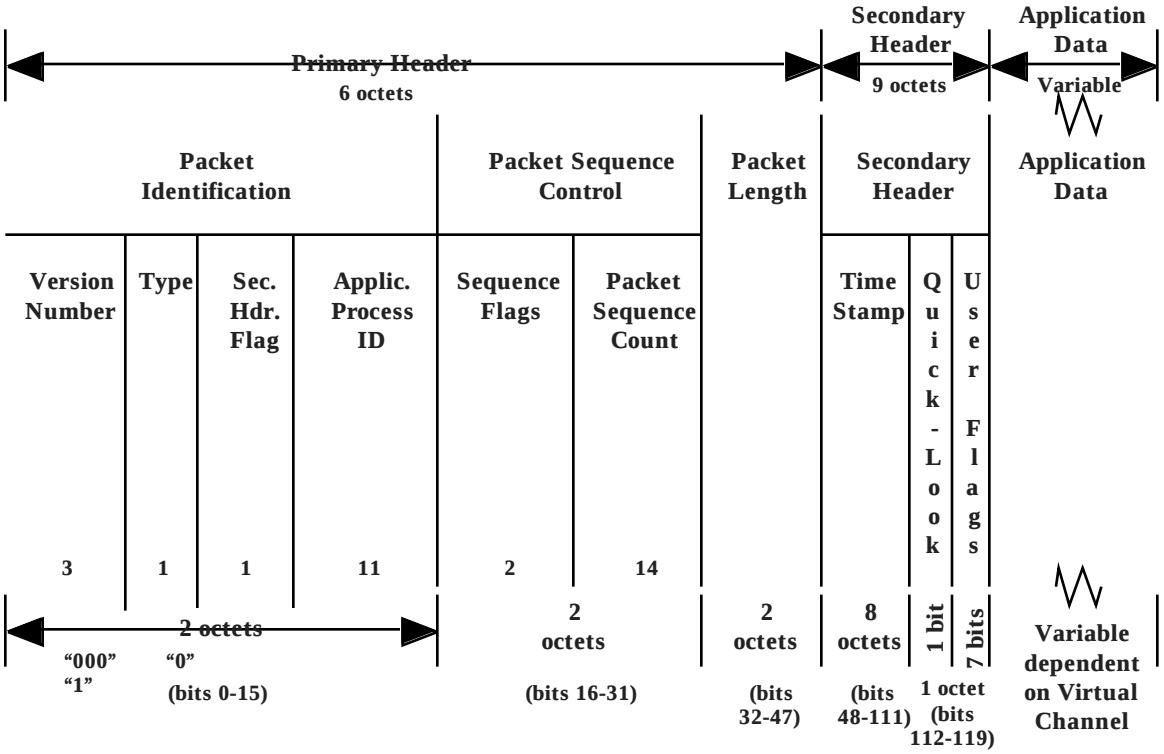

Figure 8.1.4.1.1-1. Path SDU (Version-1 CCSDS Packet Format)

Primary Header: The Primary Header consists of 2 octets of packet identification, 2 octets of packet sequence control, and 2 octets of packet length

- **Packet Identification (2 Octets)**

Bits 0 through 2 contain the Version Number. These three bits shall be set to "000", signifying the Version-1 CCSDS Packet.

Bit 3 contains the Type bit. The Type bit is not used within the CCSDS Advanced Orbiting Systems; however, the Type bit is set to "0" indicating a telemetry packet.

Bit 4 contains the Secondary Header Flag. All spacecraft telemetry and science data packets have secondary headers. The flag is set to value "1".

Bits 5 through 15 contain the Application Process Identifier (APID). The APID uniquely identifies the individual application process within the Spacecraft which created the application data in the CCSDS Packet. The APIDs for H/K telemetry, Health and Safety (H&S) telemetry and diagnostic telemetry are the same as their virtual channel identification numbers in the downlink. The APID assignments are as shown in Table 8.1.4.1.1-1. APIDs remain fixed throughout the spacecraft's mission life.

Table 8.1.4.1.1-1. Science and Non-Science Destinations and APID Assignments

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s) in Data Set	DAAC Destination for an EDS	DAAC Destination for a PDS
Non-Science Data				
Merged H/K	1 = x'1'	1 = x'1'	N/A	GSFC
Merged H/K	11 = x'B'	1 = x'1'	N/A	GSFC
Health & Safety	2 = x'2'	2 = x'2'	N/A	GSFC
Diagnostic	3 = x'3'	3 = x'3'	N/A	GSFC
Ancillary	11 = x'B'	4 = x'4'	N/A	GSFC
Standby	2 = x'2'	5 = x'5'	N/A	GSFC
Diagnostic	3 = x'3'	6 = x'6'	N/A	GSFC
Science Data				
MODIS / Science & Engineering, and Memory Dump	42 = x'2A'	Any single APID from 64 = x'40' through 127 = x'7F'	GSFC	GSFC
CERES - Fore / Science	11 = x'B'	131 = x'83'	LaRC	LaRC
CERES - Fore / Calibration	11 = x'B'	132 = x'84'	LaRC	LaRC
CERES - Fore / Diagnostic	11 = x'B'	133 = x'85'	LaRC	LaRC
CERES - Aft / Science	11 = x'B'	167 = x'A7'	LaRC	LaRC
CERES - Aft / Calibration	11 = x'B'	168 = x'A8'	LaRC	LaRC
CERES - Aft / Diagnostic	11 = x'B'	169 = x'A9'	LaRC	LaRC
MOPITT / Science	11 = x'B'	192 = x'C0'	LaRC	LaRC
MOPITT / Engineering	11 = x'B'	193 = x'C1'	LaRC	LaRC
MOPITT / Test	11 = x'B'	194 = x'C2'	LaRC	LaRC
Note: VNIR(1), VNIR(2), SWIR, and TIR EDSs each have 2 or more APIDs ((Data Type: S = Science, S&E = Science and Engineering, E = Engineering).				
VNIR (1) / Observation	17 = x'11'	S = 257 = x'101' and S&E = 259 = x'103'	GSFC DAAC	N/A
VNIR (1) / Calibration	17 = x'11'	S = 261 = x'105' and S&E = 263 = x'107'	GSFC DAAC	N/A
VNIR (1) / Test	17 = x'11'	S = 265 = x'109' and S&E = 267 = x'10B'	GSFC DAAC	N/A

Table 8.1.4.1.1-1. Science and Non-Science Destinations and APID Assignments (Continued)

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s) in Data Set	DAAC Destination for an EDS	DAAC Destination for a PDS
VNIR (2) / Observation	30 = x'1E'	S= 273 = x'111' and S&E = 275 = x'113'	GSFC DAAC	N/A
VNIR (2) / Calibration	30 = x'1E'	S = 277 = x'115' and S&E = 279 = x'117'	GSFC DAAC	N/A
VNIR (2) / Test	30 = x'1E'	S =281 = x'119' and S&E = 283 = x'11B'	GSFC DAAC	N/A
SWIR / Observation	18 = x'12'	S = 289 = x'121' and S&E = 291 = x'123'	GSFC DAAC	N/A
SWIR / Calibration	18 = x'12'	293 = x'125' and S&E = 295 = x'127'	GSFC DAAC	N/A
SWIR / Test	18 = x'12'	S = 297 = x'129' and S&E = 299 = x'12B'	GSFC DAAC	N/A
TIR / Observation	23 = x'17'	S = 305 = x'131', S&E = 307 = x'133', and E = 306 = x'132'	GSFC DAAC	N/A
TIR / Calibration	23 = x'17'	S = 309 = x'135', S&E = 311 = x'137', and E = 310 = x'136'	GSFC DAAC	N/A
TIR / Test	23 = x'17'	S = 313 = x'139', S&E = 315 = x'13B', and E = 314 = x'13A'	GSFC DAAC	N/A
MISR Charge Coupled Device (CCD) (1 Science APID for each of 9 cameras) / Science	41 = x'29'	320 = x'140'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	323 = x'143'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	325 = x'145'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	326 = x'146'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	329 = x'149'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	330 = x'14A'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	332 = x'14C'	LaRC	LaRC

Table 8.1.4.1.1-1. Science and Non-Science Destinations and APID Assignments (Continued)

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s) in Data Set	DAAC Destination for an EDS	DAAC Destination for a PDS
MISR CCD /Science	41 = x'29'	335 = x'14F'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	337 = x'151'	LaRC	LaRC
MISR CCD / Calibration (1 Calibration for each of 9 cameras)	41 = x'29'	340 = x'154'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	343 = x'157'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	344 = x'158'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	347 = x'15B'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	349 = x'15D'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	350 = x'15E'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	353 = x'161'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	354 = x'162'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	356 = x'164'	LaRC	LaRC
MISR / Non Calibration / Engineering	41 = x'29'	338 = x'152'	LaRC	LaRC
MISR (On Board Calibrator) / Calibration	41 = x'29'	359 = x'167'	LaRC	LaRC
MISR / Test	41 = x'29'	360 = x'168'	LaRC	LaRC
MISR / Motor	41 = x'29'	361 = x'169'	LaRC	LaRC

- **Packet Sequence Control (2 Octets) (Note: Packet Sequence Control bits are not applicable for EDOS processing)**

Bits 16 and 17 contain the Sequence Flags. The Sequence Flags indicate the sequence of the data in the VCDU relative to a packet. The Sequence Flags are not processed by EDOS since they are not part of the CCSDS protocol.

Bits 18 through 31 contain the Packet Sequence Count. All telemetry packets contain a sequence number. This field is a monotonically increasing field returning to zero upon exceeding the maximum value of 16,383.

- **Packet Length (2 Octets)**

Bits 32 through 47 contain the Packet Length. The Packet Length field contains a sequential 16-bit binary count of the length "C" (in octets) of the packet excluding the primary header. The field shall be the count of the total number of octets which occur in the packet following the last bit of the Primary Header, expressed as: C = { (number of octets) -1 }.

Secondary Header: The Secondary Header contains the Time Stamp within 8 octets, and the quick-look and User Flags within 1 octet.

Bits 48 through 111, the Time Stamp (Time Code) field (Table 8.1.4.1.1-2), contains the 64-bit CCSDS Day Segmented Time Code (Reference ICD Paragraph 2.1.2, Applicable Document 9). This applies to the H/K telemetry, the H&S telemetry, the diagnostic telemetry, and the science data.

Bit 112, the quick-look flag is set and reset by command. The quick-look flag is true when its value is "1".

Bits 113 through 119 contain the User Flags. The seven flags, 1-bit each, are reserved and are set to "0".

Table 8.1.4.1.1-2. Spacecraft Time Format (Time Stamp/Time Code)

Spacecraft Time Format (Time Stamp/Time Code)						
Data Word No. (*)	Starting (MSB) Bit (**)	No. Bits (***)	Description	Units	Format	Scaling
1	0	16	Days since 1958 January 1 (****)	Days	US	0
2/3	0	32	Millisecond of Day (number milliseconds since beginning of current day)	msec	US	0
4	0	16	Microsecond of Millisecond (number microseconds in current millisecond)	micro-sec	US	0

Notes:

(*) - Word 1 is the first data word transmitted

(**) - Bit 0 is the first bit transmitted

(***) - Values which extend beyond the end of a 16-bit data word are continued starting bit 0 of the next data word.

(****) - The first seven bits of the day field, the P field (preamble), are implied and not actually transmitted (i.e., this information is not included in the Spacecraft Time Stamp). These seven bits are: "1000001" (reading left to right: bits "100"=Day Segmented, "0"=1958 1 epoch, "0"=16-bit day segment, and "01"=Microsecond resolution.

US - Unsigned

MSB - Most significant bit

- **Application Data: The Application Data contains the variable length Telemetry data characteristics.**

The application data contains the source data from the corresponding instrument data group and operation mode.

8.1.4.1.2 Production Data Set (PDS) Processing

Each instrument's operation mode yields a unique APID. EDOS gathers CCSDS packets with the same APID into Production Data Sets (PDSs) (Reference Table 8.1.4.1.1-1 of this ICD). For example, the MOPITT instrument has three modes: Science, Engineering, and Test; each with a

unique APID. Therefore EDOS builds three PDSs, each with CCSDS packets of a single APID.

EDOS creates a PDS for each science and non-science (e.g., housekeeping) (Reference Table 8.1.4.1.1-1 of this ICD) data type generated by the AM-1 Spacecraft instruments. CCSDS packet ordering within a single APID PDS is forward ordered by CCSDS Packet Secondary Header Time and forward ordered by Source Sequence Count (SSC). The SSC is a modulo 16,384 value (returning to zero upon exceeding the maximum value of 16,383) that could wrap around many times during the PDS.

To conform to Level Zero processing requirements, EDOS identifies the packets missing from the PDS. Duplicate packets are excluded from the current PDS.

DAACs' can specify the content of a PDS by modifying the PDS construction criteria in the EDOS-DAAC OA. The amount of data in any individual PDS depends on the PDS construction attributes specified in the EDOS-DAAC OA for that particular PDS.

8.1.4.1.3 Production Data Set (PDS) Format

A PDS consists of a PDS Construction Record and one (1) or more CCSDS Path SDUs.

A PDS always resides within two (2) or more files, each file being less than or equal to the maximum size specified in the EDOS-SDPS OA (Reference ICD Table 8.1.2.9-1 of this ICD for the file name convention). The first file only contains a copy of the PDS Construction Record. The remaining file(s) store the CCSDS Path SDU Packets. When the CCSDS Path SDU packets reside in two or more files, all packets with the same CCSDS packet secondary header time must reside in the same file.

When a PDS requires less than the maximum file size specified in the EDOS-SDPS OA to store the CCSDS Path SDU Packets, the PDS resides in its entirety in two files as shown below:

File number one (1) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	PDS Construction Record (Refer to Table 8.1.2.7-1)		

File number two (2) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for all Path SDUs in the PDS		

When a PDS requires more than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, the PDS resides in its entirety in more than two files as shown below. The storage of Path SDUs continues (in the normal PDS construction Path SDU sequential order) across the file boundaries.

File number one (1) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	PDS Construction Record (Refer to Table 8.1.2.7-1)		

File number two (2) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for the Path SDUs in the PDS		

. . . . . Additional Files as required . . . . . .

File number "n" (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for the Path SDUs in the PDS		

A pictorial view of the above PDS stored in the files, when the PDS requires more than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, is as shown below:

File number 1 (<= the maximum size specified in the EDOS- DAAC OA) in the PDS

PDS Construction Record

File number 2 (<= the maximum size specified in the EDOS- DAAC OA) in the PDS

Path SDU	…	Path SDU

.
.
.

File number "n" (<= the maximum size specified in the EDOS- DAAC OA) in the PDS

Path SDU	…	Path SDU

8.1.4.1.4 Expedited Data Set (EDS) Processing

EDSs provide an expedited look at the science and engineering data generated by the AM-1 instruments. An EDS is built by EDOS when the CCSDS version 1 packets received by EDOS have the quick-look flag set in the secondary header by the on-board instrument or as directed by the EOC (as defined in the EDOS-DAAC OA), to build an EDS for the next SCS. EDS processing takes precedence over PDS processing.

EDOS creates EDSs on a multiple APID basis for instruments VNIR(1), VNIR(2), SWIR, and TIR, and on a single APID basis for the other instruments (refer to Table 8.1.4.1.1-1). Refer to ICD Paragraph 2.1.1 Applicable Document number 19 for CCSDS packet ordering for and EDS with multiple APIDs. CCSDS packet ordering within an EDS with a single APID is forward ordered by CCSDS Packet Secondary Header Time and forward ordered by SSC. The actual sequence number of the packet is the CCSDS Source Sequence Count assigned to the packet by the instrument that generated it. The SSC is a modulo 16,384 value (returning to zero upon exceeding the maximum value of 16,383) that could wrap around many times during the EDS.

Redundant packets are excluded from an EDS. When more than one copy of a packet exists, only the best quality packet is included in the EDS.

Packets within an EDS will also be used to build a PDS. Each EDS contains packets from a single specific SCS.

EDOS stores packets for an EDS in the order they are received with minimal processing. Therefore, EDSs constructed when the CCSDS packet's secondary header quick-look flag is set could have an erroneous count for the number of packets with SSC discontinuities. EDOS is unable to distinguish between a packet that is truly missing, a packet that is out of order, and a packet that erroneously does not have the quick-look flag set. This means the number of SSC discontinuities is incremented when packets do not have the quick-look flag set, a packet that is out of order, and when the packets are truly missing. To determine if a packet is truly missing, an evaluation needs to be made of the associated PDS that contains the packets within the EDS to determine its absence. EDOS does not perform this type of missing packet processing for expedited data.

An EDS always resides within two (2) or more files, each file being less than or equal to the maximum size specified in the EDOS-DAAC OA. The first file only contains a copy of the EDS Construction Record. The remaining file(s) store the CCSDS Path SDU Packets. When the CCSDS Path SDU packets reside in two or more files, all packets with the same CCSDS packet secondary header time must reside in the same file.

EDOS has the capability to build EDSs for the non-science data (Reference ICD Table 8.1.4.1.1-1). However, EDOS anticipates that requests for preparing non-science EDSs will be rare since EDOS already delivers non-science data per SCS in the form of Rate Buffered Path Service EDUs (Reference ICD Table 5.3.3-1) and Real-time Path Service EDUs (Reference ICD Table 5.3.2-1).

8.1.4.1.5 Expedited Data Set (EDS) Format

After an EDS is built, EDOS electronically transmits the EDS to a DAAC. The GSFC DAAC receives the ASTER GDS EDSs (VNIR(1), VNIR(2), SWIR, and TIR) (Reference Table 8.1.4.1.1-1).

An EDS consists of a EDS Construction Record and one (1) or more CCSDS Path SDUs.

When an EDS requires less than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, the EDS resides in its entirety in two files as shown below.

File number one (1) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	EDS Construction Record (Refer to Table 8.1.2.7-1)		

File number two (2) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for all Path SDUs in the EDS.		

When an EDS requires more than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, the EDS resides in its entirety in more than two files as shown below. The storage of Path SDUs continues (in the normal EDS construction Path SDU sequential order) across the file boundaries.

File number one (1) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	EDS Construction Record (Refer to Table 8.1.2.7-1)		

File number two (2) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for the Path SDUs in the EDS		

. . . . . Additional Files as required . . . . . .

File number "n" (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for the Path SDUs in the EDS		

A pictorial view of the above EDS stored in the files, when the EDS requires more than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, is as shown below:

File number 1 (<= the maximum size specified in the EDOS- DAAC OA) in the EDS

EDS Construction Record

File number 2 (<= the maximum size specified in the EDOS- DAAC OA) in the EDS

Path SDU	...	Path SDU

.
.
.

File number "n" (<= the maximum size specified in the EDOS- DAAC OA) in the EDS

Path SDU	...	Path SDU

8.1.4.1.6 EDOS Archive Removable Physical Media Unit Format

An EDOS Archive Removable Physical Media Unit contains one or more PDS(s) stored in UNIX TAR format. Each unit may contain PDSs for non-science spacecraft data, and for multiple, potentially all, spacecraft instruments.

PDS(s) stored on a physical media unit reside in their entirety on this physical media unit, i.e. not partially stored on one physical media unit and continued onto the next physical media unit. The format and content of an EDOS Archive Removable Physical Media Unit storing PDS(s) is as follows:

PDS Physical Media Unit Delivery Record File (Reference Table 8.1.3.3-1 of this ICD).

PDS (Refer to Paragraph 8.1.4.1.3 of this ICD) For PDS number "1", two or more Files are present (each being less than or equal to the maximum file size specified in the respective EDOS-DAAC OA). The first file only contains the PDS Construction Record, and each file thereafter contains the Path SDUs.)

. . . Additional PDSs (if applicable)

PDS (Refer to Paragraph 8.1.4.1.3 of this ICD) For PDS number "n", two or more Files are present (each being less than or equal to the maximum file size specified in the respective EDOS-DAAC OA). The

first file only contains the PDS Construction Record, and each file thereafter contains the Path SDUs.)

EOF (End-of-file)

A pictorial view of the above EDOS Archived PDSs (varying in size) in files on a Physical Media Unit in the TAR format is as shown below:

PDS Physical Media Unit Delivery Record File	PDS construction record in a separate file for "<PDS1>00"	Path SDUs in a file for "<PDS1>01"	Path SDUs in a file for "<PDS1>02"	PDS construction record in a separate file for "<PDS2>00"

Path SDUs in a file for "<PDS2>01"	Path SDUs in a file for "<PDS2>02"	Path SDUs in a file for "<PDS2>03"	PDS construction record in a separate file for "<PDS3>00"	Path SDUs in a file for "<PDS3>01"

Path SDUs in a file for "<PDS3>02"

.
.
.

PDS construction record in a separate file for "<PDSn>00"	Path SDUs in a file for "<PDSn>01"

EOF (End-of-file)

A second pictorial view of the PDSs in files on a Removable Physical Media Unit in the TAR format is as shown below (Figure 8.1.4.1.6-1):

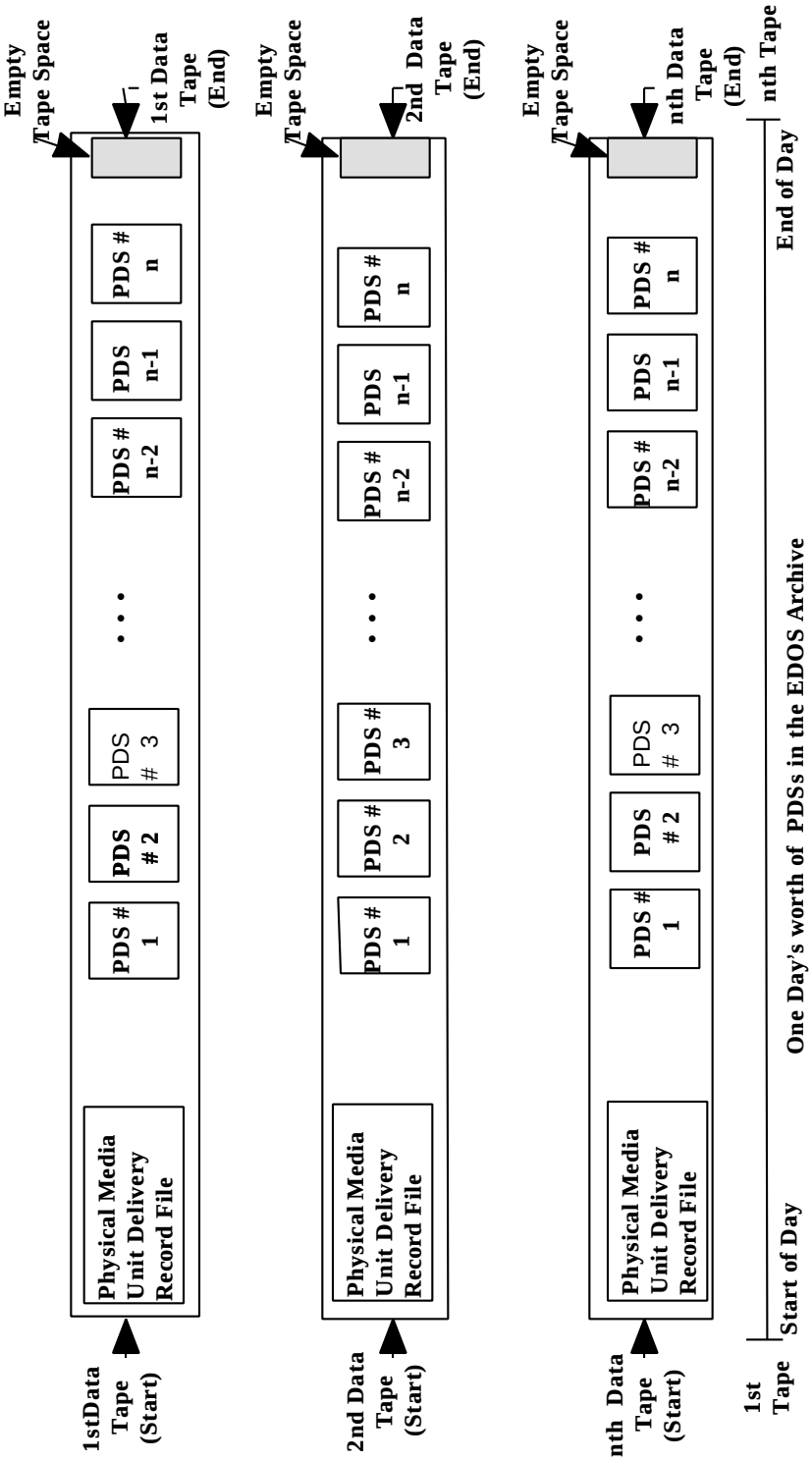

Figure 8.1.4.1.6-1. EDOS Archived Removable Physical Media Unit

NOTES:
1) The maximum size of a file that stores data for a PDS will be as defined in an OA.
2) A PDS resides in 2 or more files (the Construction Record in a file and followed by 1 or more files containing Path SDUs).
3) The maximum size of a PDS will be as specified in an OA.
4) A PDS resides in its entirety on one physical media unit.
5) Destinations that EDOS delivers the PDSs to specify the size of the Files and PDSs. The respective OAs for these interfaces define the maximum size of the files and PDSs.

8.1.4.1.7 EDOS Archive Media Requests and Bar Code

A DAAC may request PDSs from the EDOS archive to replace missing or corrupted data. Such archived data will be sent to the DAAC on magnetic tape (Removable Physical Media Unit).

EDOS records Archive PDSs, on magnetic tape (D3 tapes) (Reference Paragraph 8.1.4.1.3 and 8.1.4.1.6 of this ICD for information about EDOS Archive PDS Processing and Physical Media Unit format). When a DAAC requires one or more PDSs from the EDOS Archive, the DAAC requests the PDS(s) following the procedure(s) defined in the EDOS-DAAC OA. EDOS personnel will send a copy of the entire EDOS Archive media (with all the PDSs that reside on the unit) to the DAAC on D3 tapes. This physical media unit will have an accompanying EDOS Archive Physical Media Unit Identification and an EDOS Archive PDS Physical Media Unit Delivery Letter (Reference Paragraph 8.1.3.4 of this ICD).

The EDOS Archive Physical Media Unit Identification is the Bar Code. Each D3 physical media unit will contain a Bar Code scheme of "3-of-9" formatted as specified by Storage Technologies (STK) Inc. for its Tape robotic system. EDOS does not use robotics for archive management, but both ASTER GDS and the DAACs will use D3 robotics systems. The Bar Code 3-of-9 scheme contains six (6) alphanumeric characters.

8.1.4.2 DAAC to EDOS Data Sets (DEDS)

EDOS may request data sets from a DAAC archive to replace missing or corrupted data. Level 0 PDSs will be maintained at the DAACs for one year. After one year, Level 1A data corresponding to the desired PDS will be supplied to EDOS.

DAACs will supply DEDS on D3 media. The media will contain a DEDS Media Description File that describes its contents. The media will also be accompanied by a Packing List (Reference paragraph 8.1.3.5) describing the contents of the tape(s). Operational procedures for the delivery of these products are described in the EDOS - DAAC OA.

The DAAC to EDOS Data Sets (DEDS) are in TAR format on the physical media units. No absolute path names are utilized in the TAR command creating the data sets.

8.1.4.3 ASTER Mission Data to/from the EDC DAAC

Since EDOS archives the ASTER Ground Data System Level 0 PDSs, EGS Elements may contact EDOS to request copies of such archived PDSs. EDOS stores in its archive all the PDSs it generates for ASTER GDS, whether or not the PDSs were initially sent to ASTER GDS after their construction by EDOS. Since EDC DAAC archives the ASTER GDS Level 1A data sets, EDOS may contact the EDC DAAC to request ASTER Level 1A DEDS.

Section 8 - EDOS - DAAC Interface Design Error! Bookmark not defined.